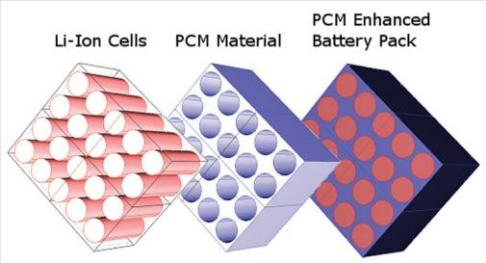
SAE 2010

AllCell Technologies PCM Passive Battery Cooler



Modern lithium-ion batteries are a boon to EV battery power density, but they present cooling challenges. AllCell's phase-change material (PCM) pack surrounds individual cells in a graphite/wax material. As a cell heats up, the wax in the material around it melts, and this change from a solid to a liquid (still contained in the graphite substrate) absorbs a great deal of heat, preventing one slightly overheating cell from touching off a thermal runaway event. When fitted to an E-Ton scooter in Europe, it allowed the battery cells to be positioned much closer together, doubling the range from 24-48 miles. They're not ideal for large hybrid-EVs, as the duty cycle has them constantly charging and discharging, generating more heat than such a passive system can manage alone, but it could be used to help systems designers bridge between average and worst-case scenarios while minimizing the active cooling system's size and capacity.